bubbles or dots. Thus, the smooth line shown in tap two costs more computational time to display and reconfigure than taps three and four, which are increasingly more sampled and small. A fifth tap returns to the smooth and continuous line that was originally shown in the tactile system. Also shown is a raised bar around the control region that may be reconfigurable or permanent based on the user's needs but would easily be identified by a finger as a region that does not take input in an alphanumeric or Braille sense but rather in a control sense.

[0064] FIG. **21** shows a shape based tactile-based computing system or "tap and drop" system screen in which different types of systems that are now implemented in a standard computation system may be implemented in the tactile-based system as well. One sees a next and enter button at the bottom of the screen that may simply ask a forward and backward screen during the reconfiguration of the screen. A legend section shown at the left hand of the screen may provide large amounts of text or symbols for a tactile-based writer or a reader to use or implement into the screen and may include all of alphanumeric text, Braille sections and icon-based computing. This is in addition to the control region, which is still put at the bottom right hand corner of the screen.

[0065] FIG. **22** shows a sample operation of the tactile-based or tap-and-drop computing in which a double tap on an icon in the legend section followed by a single tap in the writing region produces a particular shape, character, series of characters, Braille or otherwise. One could also envision a "shape menu" as a substitute for an icon-based menu which may be used in the legend and may be shifted out based on controls. For example, the bottom of the legend section allows a tactile-based user to create their own format, or formats an open shape and adds it to the legend. Thus, commonly used shapes, sets of characters or other menu items that appear in the tactile-written region or reading region can appear on the legend based on user preferences.

[0066] Referring now to FIG. **23**, a sample cross-section is shown in which the raised section of the screen is set apart from the control region. Thus, a user may allow the control region to have the appropriate size and configuration to their desired width and length. This allows each user, as in a Windows or UNIX-based system to configure their screen such that a control region takes the appropriate and most efficient shape. It should be noted that the continuous movement across the screen will not be efficiently handled because of the "reconfiguration time" of the current electroheleological material is on the order of a microsecond (us). Although, this amount of time would be sufficient for many different applications implementing the present invention, it would also not likely be sufficient to enable visually-impaired users to use robust computing software due to the limitations presented by the input/output of the tactile display system. Therefore the "tap-and-drop" system presents a preferable alternative to the "drag" system due to the conversation of computing resources in reconfiguring the screens.

[0067] As discussed above, the invention may also be applied in industrial and consumer areas, where a tactile-enhanced display provides for improved safety and control. This alternate embodiment is shown in its most basic form in FIG. **24**, in which two display buttons, illustrated by an "up" and "down" arrows, on a touch panel are "enhanced" by a raised edges. Which are also shown from a side view in FIG. **25**, and allow a finger to be easily guided to the correct location on the touch panel, improving control and safety, particularly in situations where a user may be distracted by other safety concerns like in an automobile or industrial setting. The advantage of the present invention in its main embodiment for the enhanced-tactile control screen application, is that it is reconfigurable, allowing any number of screens to be displayed in sequence without the computational device being forced to "render" the display to a pre-configured tactile enhancement. Thus, the reconfigurable tactile enhancements may be used in any application in which it is useful.

[0068] FIGS. **26**A and B illustrate the reconfigurable advantage of the present invention in which the tactile enhanced displays of FIGS. **24** and **25** are reconfigured to three-button tactile-enhanced touch screens from top and side views in FIGS. **26**A and B, respectively.

1-6. (canceled)

7. A computing system for the visually impaired, including:

a processor, power supply operatively connected to said processor;

said power supply also operatively connected to a set of electrical terminals, said set of electrical terminals in electrical contact with a layer of material, said layer of material responsive to electrical signals, such that said material changes physical characteristics when an electrical signal is pulsed high or low at one of said set of electrical terminals, such that a layer of flexible strong film located above said layer of material is raised or lowered accordingly.

8. The computing system for the visually impaired as recited in claim 7, wherein said layer of material is electro-heleological fluid.

9. The computer system for the visually impaired as recited in claim 7, wherein said layer of material is magneto-heleological fluid.

10. The computing system for the visually impaired as recited in claim 7, wherein said flexible film conducts a touch of a finger to complete an electrical signal.

11. The computing system as recited in claim 7, wherein said layer of material is placed in channels.

12. The computing system as recited in claim 11, wherein said outer layer has a different thickness over said channels than in areas not over said channels.

13. An input-output system for a computational system, comprising:

a power supply also operatively connected to a set of electrical terminals, said set of electrical terminals in electrical contact with a layer of material, said layer of material responsive to electrical signals, such that said material changes physical characteristics when an electrical signal is pulsed high or low at one of said set of electrical terminals, such that a layer of flexible strong film located above said layer of material is raised or lowered accordingly and

a set of input terminals in electrical contact with said layer of flexible strong film, configured such that an electri-